

## Abstract

# Improved Isometric Joystick Usability

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A ballistics subsystem is coupled to a force sensor of an isometric input device. The ballistics subsystem augments control by applying a dual gain transfer function that smoothly transitions from separate gain factors for low and high force inputs. When applied in a cursor device, such as a joystick or force pad, pointer movement is coupled to input force, not input displacement. Traditionally, an array of miniature strain gauges is used to measure the input force. A more recent method optimized for very low cost uses an array of capacitive sensors. Regardless of what physical mechanism is used to measure input force, customized algorithms are generally used to establish the feel and usability of an isometric joystick. The invention comprises several new methods for optimizing the use of an isometric joystick as a cursor-positioning device, altering the transfer function gain to take advantage of asymmetry, detecting selection and deselection, and combined selection and deselection. A method is also described to perform real time suppression of unwanted cursor motion related to selection.

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